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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,255	11/14/2003	Juha Ylitalo	60091.00265	7951

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EXAMINER	
HUYNH, CHUCK	

ART UNIT	PAPER NUMBER
2683	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,255	YLITALO, JUHA	
	Examiner	Art Unit	
	Chuck Huynh	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-33 are still currently pending.

2. Claims 1-3, 15-18, and 30-33 have been amended, and no new matter has been added.

Response to Arguments

1. Applicant's arguments filed 11/29/2005 have been fully considered but they are not persuasive.

Regarding claims 10, 15, 25 and 30, which were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention, Applicant has amended claims 15 and 30. However, claims 10 and 25 are still not supported by the specification and are indefinite and are still rejected.

Regarding claims 1-9, 11, 14-24, 26, and 29-33, they which were rejected under 35 U.S.C 103(a) as being unpatentable over Reudink in view of Oshima. Applicant argues that Reudink and Oshima, whether viewed singly or in combination, fails to disclose or suggest all the elements of any of the presently pending claims, and that Reudink does not disclose the feature of selecting

weight factors of antenna elements of the antenna array, and that Oshima does not remedy the deficiencies of Reudink.

Examiner respectfully disagrees. One ordinarily skilled in the art would combine Oshima's disclosure with Reudink to remedy Reudink's deficiency and specifically reduce interference (which Applicant noted in Remarks Page 19, last paragraph), which improves communication quality. Due to the broadness of the claim, Examiner Oshima does remedy Reudink's deficiency by disclosing selecting weight factors of antenna elements of the antenna array...in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25 "...weighting coefficient generation circuit 50 is provided...to generate weight coefficients...which are standardized such that the total sum of the weight coefficients...has a preset constant value." The preset constant value is correlated to power (Col 5, lines 52+; Col 6, lines 31-33).

Regarding claims 12-13, and 27-28 are rejected using Holma et al. priority date of 6/29/2000 in United Kingdom, which the PCT is based upon.

Regarding Applicant's argument that the Holma et al. is not prior to the effective filing date of the current Applicant, Examiner has applied new references that are prior to the current application.

Claim Objections

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claims 10 and 25 disclose a limitation wherein a primary common pilot (PCPICH) according to the WCDMA system is transmitted to the radio cell and a separate secondary common pilot (SCPICH) according to the WCDMA system is transmitted to each user-specific beam; however, there is no specific disclosure or explanation of a separate secondary common pilot (SCPICH) according to the WCDMA system that is transmitted to each user-specific beam within the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-11, 14, 15-26, 29, 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink et al. (hereinafter Reudink) in view of Oshima et al. (hereinafter Oshima).

Regarding claim 1, 16 and 31, Reudink discloses the method for determining weight factors of antenna beam (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

forming a radio cell with the antenna beam (Col 5, lines 35-44) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing the radio cell into at least two different cells by dividing the antenna beam (Col 5, lines 55-57; Fig. 8) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]).

Reudink discloses all the particulars of the claim, but is unclear on selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of a radio cell formed with the antenna array and corresponding weight factors of at least one, second radio cell formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights for signals (Col 7, lines 7-19) in consideration for power for multiple beams targeting different sectors (Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna

element specific sums of weight factors of a radio cell formed with the antenna array and corresponding weight factors of at least one, second radio cell formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claims 2, 17 and 32, Reudink discloses a method for determining weight factors of antenna beams (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

dividing the antenna beam into at least two user-specific beams (Col 7, lines20-51)

Although Reudink discloses all the particulars of the claim, Reudink does not fully disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially

equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights for signals (Col 7, lines 6-19) in consideration for power for multiple user specific beams targeting (Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claims 3, 18 and 33, Reudink discloses a method for determining weight factors of antenna beams (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

forming a radio cell with the antenna beam (Col 5, lines 35-44) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing the radio cell into at least two different cells by dividing the antenna beam (Col 5, lines 55-57; Fig. 8) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing at least one antenna beam forming a radio cell into at least two user-specific beams (Col 7, lines20-51).

Reudink discloses all the particulars of the claim except selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of corresponding weight factors of beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights in the same antenna array, for multiple beams can be set as equal in consideration of power (Col 7, lines 7-19; Fig. 1A,B; Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially equal within predetermined

limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claim 4 and 19, Reudink discloses a method as claimed in claim wherein the desired beam directivity (toward user) is taken into account when predetermined limits are set for the antenna element specific sums (Col 7, lines 32-34, 52-56).

Regarding claim 5 and 20, Reudink discloses a method as claimed in claim 1, wherein the minimization of crosstalk (noise) produced in another cell is taken into account when predetermined limits are set for the antenna element specific sums (Col 7, lines 34-35).

Regarding claim 6 and 21, Reudink disclose a method as claimed in claim 1, wherein the desired attenuation between different radio cells is taken into account when predetermined limits are set for the antenna element specific sums (Col 7, lines 52-55).

Regarding claim 7 and 22, Reudink discloses a method as claimed in claim 1, wherein the achieving of the necessary capacity in the desired geographical area (coverage area) is taken into account when predetermined limits are set for the antenna element specific sums (Col 5, lines 19-34).

Regarding claim 8 and 23, Reudink discloses a method as claimed in claim 1, wherein the weight factors of the antenna elements of the antenna array are selected by numerical estimation (Col 7, lines 7-19).

Regarding claim 9 and 24, Reudink discloses a method as claimed in claim 1, wherein the weight factors of the antenna elements of the antenna array are selected by analytical examination (Col 7, lines 7-19).

Regarding claim 10 and 25, the limitation of wherein a primary common pilot (PCPICH) according to the WCDMA system is transmitted to the radio cell and a separate secondary common pilot (SCPICH) according to the WCDMA system is transmitted to each user-specific beam are particular requirements of the particular system of WCDMA.

Therefore, it would have been obvious for one ordinarily skilled in the art at the time of invention to comply with the particulars of the system. Thus, design choice obviousness expedient.

Regarding claim 11 and 26, Reudink discloses a method as claimed in claim 1, wherein the antenna beams are formed by an analogue beam forming method (entire reference).

Regarding claim 14 and 29, Reudink discloses a method as claimed in claim 2, wherein a different scrambling code is used in one or more user-specific beams (individual identification code for each mobile user) (Col 7, lines 45-47).

Regarding claims 15 and 30, Reudink discloses a method as claimed in claim 1, wherein the power balance is as equal as possible (Col 7, lines 55-56).

3. Claims 12 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink in view of Oshima in further view of Hagerman et al. (hereinafter Hagerman).

Regarding claim 12 and 27, Reudink in view of Oshima discloses all the particulars of the claim, but is unclear on a method as claimed in claim 1, wherein the antenna beams are formed by a digital beam forming method.

However, Hagerman does disclose the antenna beams are formed by a digital beam forming method (Col 4, lines 5-9).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Hagerman's disclosure to provide another method to form antenna beams using digital data, signal and technology.

4. Claim 13, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink in view of Oshima in further view of Zhang et al. (hereinafter Zhang).

Regarding claim 13 and 28, Reudink in view of Oshima discloses all the particulars of the claim, but is unclear on a method as claimed in claim 1, wherein the weight factors are complex.

However, Zhang does disclose the weight factors are complex (Col 1-2, lines 61 – lines 6)

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Zhang's disclosure to provide a way to calculate complex weight factors and a method of using complex weight factors to improve beam-forming method.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sato; Toshifumi discloses a Base station transmitter/receiver capable of varying

composite directivity of antennas

Dent; Paul W. discloses a Multiple access communications system and method using code and time division

(For more refer to Reference Cited Form PTO-892)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Huynh whose telephone number is 571-272-7866. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chuck Huynh

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